Name: Date:

Polynomial Factoring solution (version 601)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 132}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-32}}{2}$$

$$x = \frac{-10 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 4\sqrt{2}\, i}{2}$$

$$x = -5 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 + 7i$ and $-9 + 2i$ in standard form $(a + bi)$.**

Solution

$$(-5 + 7i) \cdot (-9 + 2i)$$

$$45 - 10i - 63i + 14i^2$$

$$45 - 10i - 63i - 14$$

$$45 - 14 - 10i - 63i$$

$$31 - 73i$$

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3. **Write function $f(x) = x^3 - 4x^2 - 11x + 30$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	-4	-11	30
5		5	5	-30
	1	1	-6	0

$$f(x) = (x-5)(x^2+x-6)$$

$$f(x) = (x-5)(x-2)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)\cdot(x+1)^2\cdot(x-3)^2$$

Sketch a graph of polynomial $y = p(x)$.